

In 2001 the second Higher Harmonic Control Aeroacoustic Rotor Test (HART II) was jointly performed by US Army AFDD, NASA Langley, DLR, Onera and DNW. Its purpose was to generate a comprehensive database for a 40% Mach-scaled Bo105 hingeless model rotor in a descending flight where strong blade-vortex interaction (BVI) occurs. The measurements covered the rotor loads, the pressure distribution at the blade leading edge and – at one radial station – in chordwise direction, blade deformation, acoustic radiation and wind tunnel data. Strong emphasis was placed on measurement of wake vortex trajectories and velocity fields induced by individual tip vortices over the entire rotor disk.

### **Measurements include:**

- wind tunnel data (air data system)
- rotor data (6 component balance)
- blade deformation (SPR = Stereo Pattern recognition)
- blade pressures (Kulite absolute pressure transducer)
- acoustics (Microphones)
- flow visualization (Laser Light Sheet)
- vortex flow (3D Particle Image Velocimetry)

### **Milestones:**

1994: HART I test in DNW (1994-1996: analysis revealed that the lack of wake data was an essential key information missing)

1996: Gruppo Agusta International Award for the HART I Team

1996: Initiation for HART II (initially planned for 1998, but postponed due to contract measurements, development of PIV from 2C to 3C stereo measurements, loss of main rotor during an EU contract measurement, retro-fit of an older Bo105 model rotor with Kulites)

2001: HART II test in DNW

2004: Howard Hughes Award for the HART II team

2004: Cheesman Award: Experimental Analysis of ONERA Methodology for the Prediction of Blade-Vortex Interaction Noise by J. Bailey, Y. Delrieux, and P. Beaumier, ONERA

2005: Establishment of the International HART II Workshop at the ERF in Florence, Italy

2010: The magic number of 100 with respect to publications related to HART II was exceeded (reports, conference papers, Journal articles, book contributions etc.)

### **Publication Disclosure Agreement**

Please inform us if you intend to publish using HART II data. We will gladly review your draft for correctness of the data information prior to publication. Please fill out the publication disclosure agreement form and return it as guided in the form when accessing the database for the purpose of publication - filling up the form is one-time event. We also expect the acknowledgement of HART II team appears in your publication as follows:

The author would like to acknowledge the cooperation of the HART II team during the preparation, acquisition, and post-test phases of the HART II test.

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There are three major menus available:

- 1) Test Data: contains a number of reports about the test itself as well as data analysis and results
- 2) HART II Workshops: contains agenda and new information of each workshop
- 3) Publications: all conference papers regarding the HART II test, data, and code validation activities provided herein for download. Journal articles and reports are partially available due to proprietary issue. The File, public-hart2.pdf contains a complete list of the publications.